DOCUMENT RESUME

ED 213 051 CS 503 697

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TITLE Basic Communication Fidelity: An Initial Investigation.
SPONS AGENCY North Texas State Univ., Denton.
PUB DATE 28 Oct 80
NOTE 31p.; Paper presented at the Annual Meeting of the International Communication Association (Minneapolis, MN, May 21-25, 1981).

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Communication (Thought Transfer); Communication Problems; *Communication Research; Communication Skills; *Evaluation Methods; Interpersonal Competence; *Models; Speech Communication

ABSTRACT

Defining communication fidelity as the communication of ideas by one person in a way that results in the construction of congruent ideas by the recipient of that communication, this paper describes a model of basic communication based on this construct that will provide specific information about communication problems. The paper also discusses five studies that investigated the various aspects of the model and explores the model's implications for researchers and educators. (FL)

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# BASIC COMMUNICATION FIDELITY: AN INITIAL INVESTIGATION

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28 October 1980

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This research was partially supported by two grants from the North Texas State University Faculty Research Committee. The opinions expressed herein do not necessarily reflect the position or policy of the granting agency and no official endorsement should be inferred.

CS503697

# BASIC COMMUNICATION FIDELITY:
# AN INITIAL INVESTIGATION

The evaluation of a speaker's ability is an integral part of the education system associated with the field of Speech Communication. Recently, the "back to basics" thrust has produced a growing concern related to the assessment of literacy (Lieb-Brilhart & Brown, 1978). This concern expresses a continuing examination and consideration of such concepts as communication effectiveness (Brandt, 1979; Freimuth, 1976; Gunderson & Hopper, 1976; Miller, 1975), communication competence (Backlund, 1978; Krauss & Glucksberg, 1969; Weimann, 1977), functional communication (Larson, 1978; Larson, Backlund, Redmond & Barbour, 1978), and interpersonal competence (Bienvenu, 1971; Bochner & Kelly, 1974; Weinstein, 1969). This paper discusses an elementary model of communication fidelity as a prerequisite to communication competence relative to its conceptual implications for communication education and research implications for teacher selection and training.

In keeping with the back-to-basic thrust, it would appear that inherent within each of the above communication success models is a recurring but undeveloped required construct identified for the purposes of this paper as Basic Communication Fidelity (BCF).[1] Conceptually, BCF is defined as the communication of cognitions by one person in such a manner as to result in congruent cognitions being constructed by the recipients of that communication. Assessment of communication success

models has been made by either self-report or trained observer evaluation methods. Both methods result in subjective evaluations. The criteria or components which are subjectively evaluated regarding those constructs have been generated either simply as a manner of traditional public speaking evaluation criteria or research efforts identifying dimensions or factors associated with the constructs. Such conceptual research associated with these constructs appears to consistently reflect conceptualizations bound to the construct of social competence.

Yet, many of the communication success models contain components related to BCF. For example, conceptual components such as ability to demonstrate (Backlund, 1978), informing (Allen & Brown, 1976, Wells, 1973), clarity of expression (Bienvenu, 1971), basic speech communication skills (Bassett, Whittington, & Spicer, 1978), and empathy (Bochner & Kelly, 1974; Weimann, 1977), all point toward the essential nature of a BCF construct. Although little previous effort has been devoted to conceptual and operational expansion of this concept, it is self-evident that without basic fidelity in communication events, socially successful interactions are accidental, if not impossible.

Thus, unlike previous conceptualizations, BCF is not concerned with the social appropriateness or accuracy of the initial source cognition nor the ultimate receiver cognition, but rather focuses upon those factors specifically addressing the issue of congruent cognitions between source and receiver following communication behavior by the source. Through the development of a "basics" approach more specificity will be available in distinguishing actual communication problems. Utilization of the BCF construct suggests four primary outcomes are possible. Table 1 details those outcomes.

Table 1 About Here

Theoretically, cognitions of the source and receiver may be classified as accurate/appropriate or inaccurate/inappropriate on the basis of contemporary knowledge, standards, and socio-cultural criteria. For example, under certain conditions, $E = mc^2$ is an accurate cognition while $E = mc^3$ is inaccurate. On a different level, appreciation for another's act of kindness is an appropriate cognition while non-appreciation is an inappropriate cognition. This classification represents the assertion of a "social reality" agreed to by the members of a community and plays a major role in traditional judgements of communication competence.

Prior to the BCF conceptualization, when the cognitions of the reciever (following communication from the source) were classified as accurate/appropriate the communication from the source was judged to be competent (i.e., Outcomes 1 and 4). Utilizing the BCF construct, Outcome 1 would indeed, represent competent communication. However, Outcome 4 would not represent competent communication due to the lack of congruity between the cognitions of source and receiver. Further, in addition to the communication problem in Outcome 4, the source also has an inaccurate/inappropriate perspective of social reality--a problem distinct from the communication of such a cognition.

Conversely, within a more conventional competence framework, Outcomes 2 and 3 would result in judgements of noncompetent communication as a function of the inaccurate/inappropriate classification of the receiver's cognition. Yet only Outcome 2 actually represents a basic communication problem--incongruent cognitions of the source and receiver.

Of principle importance is the realization that Outcome 3 represents a high fidelity of communication even though the source cognition was initially inaccurate/inappropriate and the receiver cognition ultimately inaccurate/inappropriate.

Thus the BCF construct provides some insight into the potential foci of instructional/therapeutic strategies. Within the confines of this model, many psychologically disturbed/intellectually handicapped individuals are basically high fidelity communicators in spite of their inaccurate/inappropriate cognitions of social reality. In a similar vein, many mentally "normal" individuals have inaccurate/inappropriate cognitions of social reality yet are also basically high fidelity communicators. The latter group, however, would typically be classified as noncompetent communicators. On the other hand, a significant portion of the population have accurate/appropriate source cognitions yet are indeed low fidelity communicators. These two groups of "normal" individuals are typically classified as one and the same. Differentiation of groups would allow communication training efforts to be placed where they could resolve an actual problem. The inaccurate/inappropriate source cognition group should be the focus of educational, cultural, and possibly psychological exposure. The group having distinctive communication fidelity problems should be the focus of generic communication skill development, education and training.

Further differentiation of problem areas may be made clear by adding components to the basic BCF model. Figure 1 depicts an outcome framework with the variables of social reality and communication behavior added. "Social reality" (A) represents accuracy/appropriateness as

Figure 1 About Here

determined by current knowledge and socio-cultural standards. "Source cognition" represents the individual view of social reality held by, and desired to be communicated by the source. "Communication behavior" refers to the verbal and nonverbal components utilized by the source to represent the source's cognition to another. "Receiver cognition" represents the cognition constructed by another following observation of the source's communication behavior.

The source cognition representing social reality may be congruent (A) or incongruent (B) with social reality. Given these conditions, the communication behavior (as judged by a reasonable group of trained individuals) may be representative of A, B, or some other concept (C) not found in either the A or B source cognition. The receiver cognition then may also be representative of one of the three communication behavior classifications (A, B, or C) or some other cognition (D) not found in the prior set. For the purpose of illustration, cognitions have been represented as either congruent or incongruent. It is recognized, however, that exact congruency is rare if not impossible. Therefore, the model must maintain the flexibility to assimilate variable levels or degrees of congruency.

It is the degree of congruency, moving from one stage to the next, that yields information regarding the specific nature of problems which occur in human interaction. An incongruent social reality-source cognition link may be indicative of source specific educational, psychological or recieving problems. An incongruent source cognition-communication

behavior link may be indicative of source-specific problems in such areas as physiology, language, information processing, education, psychology, or general communication encoding skills. An incongruent communication behavior-receiver cognition link may be indicative of receiver-specific problems associated with all of the above areas. Given the non-recursive nature of human interaction, receiver cognitions, under certain conditions, become source cognitions for that receiver representing social reality, thus perpetuating and disseminating inaccurate/inappropriate perceptions of social reality. This paper cannot address that complexity holistically. Rather, it will address the source cognition-receiver cognition link as one indicant of basic communication fidelity.

This model clearly demonstrates that an examination of an individual's communication fidelity may only be made relative to a receiver's competence. Receiving skills vary between individuals; thus the best path to ascertaining source communication skills would be to assume, for conceptual clarity, the competence of the receiver. At a later point, receiver competence will be ascertained, controlled, and/or treated as a covariate. Given that assumption, several factors appear to have the potential to impact sources' BCF in communicating cognitions. Below are a series of five generalizations reflecting potential properties of the source which would appear to have a bearing upon an individual's BCF level.

1. The individual must have access to signs, signals, and symbols within the receiver's framework and knowledge of associated denotative and connotative meaning. The greater such access and knowledge, the greater the potential for BCF.

2. The individual must have linguistic capabilities in order to arrange the signs, signals, and symbols in such a manner that they become comprehendible by the receiver. The greater the syntactic capability the greater the potential for BCF.

3. The individual must be skilled in processing information. Such skills include abilities related to perceptual accuracy, decoding, recoding, encoding, neurological transmission, logic, intelligence, and many more. The greater the information processing skills, the greater the potential for BCF.

4. The individual must have an accurate awareness of culture, society, and the communication context in which the message will be transmitted. Without such an awareness, error will occur. The greater the cultural, societal, and contextual awareness, the greater the potential for BCF.

5. The individual must have sufficient physical and speech production capacities. Should one not be able to gesture or to correctly pronounce words, the receiver has minimal opportunity to develop congruent cognitions with the source. The greater the physical and speech production adequacy, the greater the potential for BCF.

It is assumed at this time that should an individual not meet some minimum level of adequacy in any one of these five areas, maximal BCF would not be tenable. Given minimal adequacy in all five areas, the BCF would theoretically increase as skill developed in any single area.

While these are relatively traditional generalizations associated in many basic textbooks to general communication competence, it should be recognized that in this case, receiver skills are assumed and the focus

is upon congruent cognitions of a source and receiver following communication behavior by the source. Thus, the realm of application of the generalizations becomes specific and definite.

Given the model of BCF and the generalizations described above, a conceptual foundation has been laid for the exploration of components within the model. The following section summarizes the progression of the research program and details the most current project.

## The Research Program

In order for a research program designed to test the BCF model to evolve, an initial limitation in scope was essential. The decision was made to concentrate upon the source cognition-receiver cognition link of the model (see Table 1). It is essential to recognize, however, that the extent of congruency or incongruency associated with the source-receiver cognitions would provide an inferential link associated with the communication behavior component of the model.

Two primary issues were addressed: (1) measurement, and (2) meaningfulness. Studies conducted to this point are summarized below with a more detailed explication of the latest work.[2]

Study 1 (Powers, 1978)

An obvious measurement restriction was the inability to discern cognitions in their raw form. Thus the challenge was to select or develop a known "social reality" which would stimulate the construction of a source cognition. That stimuli had to be simplistic enough to minimize error in cognition development by the source yet complex enough to maximize the potential to discriminate between sources' communication fidelity. The stimuli also needed to be amenable to objective,

data-based, evaluation of source-receiver congruency. Rather than relying upon language to describe a social reality to a source, the decision was made to develop social realities of graphic forms. Earlier work by Leavitt and Mueller (1951) and Lieb-Brilhart (1965) suggested the potential to utilize connected geometric shapes. This format has been utilized in classrooms to demonstrate principles of feedback and nonverbal communication.

Forty-two randomly selected subjects from the basic communication class were asked to rate the potential difficulty in communicating each of fifteen different formats. The selected format (Figure 2) yielded data representing the closest approximation to a normal distribution. In

Figure 2 About Here

order to ascertain the congruency between the source's cognition and the social reality represented by the geometric format, 100 students from the same population were given a copy of the stimuli on 8-1/2" x 11" paper, and asked to exactly reproduce the format on a blank sheet of paper. One student produced a mirror image and two students produced miniature versions. The remaining 97% congruently reproduced the format on the basis of size, shape, and relationship criteria. Thus, it was reasoned that in the vast majority of cases, it was possible to stimulate a cognition congruent with a social reality of connected geometric forms.

Study 2 (Powers, 1979a)

The next issue to be resolved was the viability of using the geometric format to derive data-based measurement of BCF. Essentially, the procedure consisted of (1) giving a source the desired cognition,

(2) having that source communicate the cognition to others, (3) having the receivers reproduce their cognitions during the communication event, (4) scoring the reproduced cognitions against the original form, and (5) assigning a BCF score to the source.

Recognizing that receiving skills varied between individuals, the initial work utilized a minimum of twenty receivers for each source with the average congruency score representing the source's BCF. It was reasoned that congruency scoring could be broken down into six basic categories. Five the six categories reflected relatively simple cognitive and behavioral activity. The sixth category, "the relationship between each form" clearly represented more complex cognitive and behavioral demands. The scoring values were weighted to include this difficulty perspective: 1 point for each congruent geometric shape, 1 point for connecting all geometric forms, 1 point for placement of starting form within Area Start, 1 point for placement of ending form within Area End, 1 point for placement of the entire set of forms within Area Vertical, and 2 points for each congruent relationship between two geometric forms (see Figure 3). The average receiver score represented each source's BCF score (having a potential range of 0.0-29.0).

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Figure 3 About Here

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Due to the developmental nature of the project, it was decided to negate feedback and thus control many of the social-oriented cognitions resulting from that activity by videotaping the communication behavior. It seemed plausible to assume at this time, a positive relationship between a source's BCF in no feedback and in maximal feedback conditions

while admitting that higher scores would be present in the latter case.

Thirty-two randomly selected subjects from basic communication classes were instructed to communicate the format so that it could be duplicated by a group of peers. A five minute time limit was imposed for the communication behavior. The following semester, each videotape was randomly assigned to one of thirty-two sections of basic communication classes. Each group of receivers (ranging in size from 20-27) were instructed to listen closely and draw the images presented by the communicator. Following the communication event receivers were instructed to complete a research packet containing measures related to ascertaining the potential impact of BCF.

Two coders were trained in scoring procedures and scored the same 51 receiver forms ($r = .91$). They then were allowed to proceed to independently code the remaining forms. BCF scores for each of the 32 sources were derived. Descriptive statistics for this data array were as follows: $\bar{X} = 15.5$, S.D. = 4.223, $S^2 = 17.834$, SE = 0.747, kurtosis = -0.961, and skewness = 0.016.

The relatively low number of subjects in this sample produced a BCF distribution approximating a normal curve. Low, moderate and high BCF groups were formed on the basis of a ± one standard deviation from the mean. Receiver apprehension did not differ across groups of receivers; however, the high BCF group produced less state anxiety in the receivers than did the moderate or low groups. Additional measures traditionally associated with communication competence concepts (credibility and interpersonal attraction) were included in the research

packet. Multivariate analysis of variance was followed by discriminant analyses for each perception variable set to ascertain the broad impact and potential meaningfulness of the BCF variable and classification procedures. Significant differences were indicated between the low and high BCF groups on the credibility perception variable set with the perceived competence dimension as the dominant contributor to explained variance (35%). Within the interpersonal attraction variable set, significant differences were indicated between the low and moderate BCF groups and between the low and high BCC groups. Task and social attraction were the dominant contributors accounting for thirty-three percent and ten percent respectively, of the explained variance. The direction of impact on credibility and task attraction was as expected. The higher the BCF, the more positive the perceptual evaluation. Interestingly, the direction was inverted with the social attraction variable.

At this stage two tentative conclusions were possible. First, it appeared that BCF was measurable on an objective data-based foundation. Second, the research suggested that BCF was potentially meaningful relative to impacting participant receivers' perceptions of the source's competence and their task attraction toward the source. The conceptual nature of these two dominant impact variables suggested the methodology clearly involved a task-orientation function. Further development and assessment was indicated.

Study 3 (Powers & Lowry, 1980a)

To further investigate the perceptual impact of BCF, a project was conducted using non-participants as subjects. It was reasoned that the conceptual definition of BCF was applicable to the act of teaching. The teacher has a cognition, communicates it to students, and students then

develop a cognition. One index of successful teaching was reflected in the congruity of cognitions.

Four advanced Ph.D. education majors viewed each of the original 32 videotapes. The evaluators were informed that each tape was made by an undergraduate major in the College of Education soon to be engaged in student teaching. Evaluators were not given the actual format used by the sources but were told that all sources were trying to communicate the same format to a group of freshmen. Evaluators were not allowed to draw the format. Following each videotape, evaluations encompassing each source's overall potential for success as teachers of science and math, and fine arts within each educational level were made. The average success potential in each area was then correlated with each source's BCF score. Correlations between each source's average success potential and respective BCF score ranged over the nine areas from .43 to .56. The moderate, but significant relationship between externally derived BCF scores and perceptions of teacher success based upon non-participant observation of communication behavior seemed encouraging. It appeared that the perceptual impact associated with the BCF task was generalizable beyond participant perceptions to include non-participant or "observer" perceptions. The relative complementarity of correlations across educational levels and content material suggested a generality of application to the educational task.

Study 4 (Powers, 1979b)

The administrative complexity encountered in Study 2 and the logistical problems inherent in using independent receiver groups (i.e., 717 receivers were utilized to obtain 32 sources' BCF scores) had to be reduced for the research program to continue at a viable pace. Thus it

became important to ascertain if one group of receivers could consistently and reliably respond to the communication behaviors of a succession of sources. It was reasoned that once receivers learned a single format, the BCF scoring procedures would no longer discriminate between sources. Thus, the first task was to compile a series of geometric formats that were all consistent in terms of difficulty, but also all different in terms of arrangement. Fifty students from basic communication classes initially rated the difficulty of 36 new geometric formats. Nine formats fell within ± .5 standard deviations of the mean perceived difficulty ratings. A source (whose BCF score in Study 2 was 15.1) was then videotaped attempting to communicate each of the formats. The videotapes were randomly assigned to one of nine randomly selected sections of the basic communication course where students served as receivers. Analysis of the data indicated four formats produced BCF scores which were not significantly different from each other. The relationship factor within each geometric format was then reversed to produce eight stimuli formats equivalent in difficulty. Twenty sources and twenty-one receivers were then randomly selected from volunteers associated with basic communication classes. Formats were randomly assigned to sources and the standard videotapes made of each source's communication behavior. The group of receivers were first exposed to a series of four training videotapes using one source and four formats not utilized in the study (two of higher difficulty and two of lower difficulty). This was conducted to acquaint the receivers with the task and minimize a learning effect of repeated exposure. The twenty videotapes were then shown to the receivers in a random order. All receivers simultaneously completed the BCF task for each source (initial test). This was followed immediately by a

second administration (immediate retest). A third administration was completed one week later (delayed retest). Analysis of the data indicated that while BCF scores significantly increased with each administration, the correlations between administrations dropped no lower than .96. Thus while within-source learning occurred as a function of repeated viewing of the same tapes over time, the relationship between individual source scores remained fairly constant.

Using only initial administration data, scores were arranged in the time sequence or order of presentation. Significant differences were not indicated between BCF scores using split halves, split thirds, or split fourths of the speaking group. On the basis of these results, it appeared that a single group of receivers could be utilized to ascertain BCF scores for a variety of speakers.

The potential to utilize a smaller group of receivers for any given source was tested by randomly deleting one receiver, recomputing BCF scores, and calculating the correlation between the BCF scores computed from 21 receivers with the scores obtained from 20 receivers. This process was continued with 2 deletions, 3 deletions, etc., until only one receiver remained. Correlations between BCF scores obtained by the entire group of 21 receivers and the reduced receiver groups remained greater than .92 until less than four receivers remained. It was tentatively concluded that the size of the receiving body used to calculate source BCF scores could be reduced and not impact the distribution of BCF scores.

Study 5 (Powers & Lowry, 1980 b)

The latest study examined the earlier established conceptual generalizations regarding BCF. It was reasoned that individuals using

English as a first language (EFL) should achieve higher BCF scores and more favorable perceptions than individuals using English as a second language (ESL). This would be consistent with generalizations 1, 2, 4, and 5 posited in the conceptual model. Based upon the earlier research (Studies 2 and 3), it was further reasoned that BCF scores should be linearly related in a positive manner with participant perceptions. The high influx of international students awarded teaching fellowships and the constant communication oriented complaints of EFL students prompted a concern for perceptions associated with college student and college teacher communication activity success. Standard procedures were utilized to obtain 42 source tapes (21 EFL and 21 ESL).[3] With the speakers appearing randomly, ten EFL students completed the receiver's task and a research packet over two days of viewing. The research packet contained measures of perceived overall competence, task attraction, social attraction, vocalic quality, and subjective probability estimates of success as a student communicating with teachers, with other students in class, and with other students out of class and subjective probability estimates of success as a teacher in communicating with other teachers, students in class, and students out of class. In addition, subjective probability estimates of the likelihood that students would seek out the source (as teacher) for assistance with difficult material and assistance with personal problems were obtained.

An analysis of variance indicated the EFL group ($\bar{X}$ = 20.0) achieved significantly greater ($F = 10.407$, $df = 40$, $p < .05$) BCF scores than did the ESL group ($\bar{X}$ = 15.9). Thus the basic conceptual generalizations received support.

A modified stepwise multiple regression analysis treating BCF, EFL/ESL and their interaction as predictor variables was performed on each perceptual variable. Significant models were generated in each case. Variance accounted for by the models ranged from .56 to .76. Only in the case of projected success as a student did the EFL/ESL variable contribute significantly to a model. In no case did the interaction variable contribute significantly to a model. The variance accounted for by the significant contribution of BCF ranged from .38 to .56. These analyses suggest the BCF variable overcame the potential effect of nationality and English learning emphasis. Scattergrams for the separate groups of EFL and ESL subjects indicate the linear plots positively correspond between both groups. This study suggests strongly that initial perceptions by participants in a communication event are impacted by the BCF variable.

The procedure used earlier (random deletion of 1 . . . n receivers) to test for the viability of reduction within the receiver groups was again followed. Correlations between reduced-receiver BCF scores and the base BCF score (ten receivers) remained above .92 (df = 41) until the receiver group size was reduced below four. Thus additional support was indicated for the feasibility of reducing the receiver group size.

At this point in the progression of the research program, BCF scores have been obtained for 92 sources. Recognizing that different procedures were used to compute BCF scores and different populations, descriptive statistics for the overall data array are as follows: $\bar{X}$ = 17.0, S = 19.603, SD = 4.427, kurtosis = -0.645, and skewness = -0.238. While a normal distribution is approximated, it would appear

the actual mean score will be slightly higher than the theoretical mean score (15.0). The difference appears to be a function of the utilization of one group of receivers over a succession of sources rather than independent groups of receivers for each source.

As one decreases the size of the receiver group, one increases the potential for dissimilar receiving skills when comparing source scores derived from different receiving groups. It is suggested that future work obtain an estimate of receiving skills relative to a base group of receivers which must then be matched by other receiving groups prior to source data comparison. Research has commenced to standardize these procedures.

## Discussion

The conceptual implications of the BCF model are relatively clear. As the basic components of communication fidelity are delineated, educators will achieve increased accuracy in determining particular problem areas. Thus, the most appropriate treatment administered by the most appropriate group for any given problem may eventually be applied. While not denying the role of communication in any of the three links within the model, it is evident that some problems heretofore designated as "communication" problems may be better resolved by trained personnel in specific areas of education and psychology. The BCF model will allow increased specificity by teachers in describing the communication process to our students and also allow us to focus our educational efforts upon specific links within the model (Brandt & Powers, 1980).

Research implications are varied. Developing a measurement procedure is more difficult than developing a measurement instrument. The

variety of potentially interacting components necessitates a cautious developmental progression. So far, measurement data has been encouraging. Continued effort to solidify the reliability and validity of the procedures should occur. Limitations must be placed upon the generalizability of the BCF data. Many issues remain to be resolved. Many questions remain to be answered.

The current data base, however, does seem to suggest that BCF may be a meaningful variable. Perceptions of a person's potential teaching success held by both participants and external observers was significantly related to BCF scores. Ceretus parabus, people who do well in the BCC task are perceived to have higher teaching success potential on numerous criteria than people who do not do as well. Field research must now be conducted to ascertain whether those perceptions are maintained in ongoing classrooms and the extent to which it impacts actual teaching success.

Ultimately, the evolved BCF procedures may serve as a screening or counseling tool for prospective teachers. The receiving group could consist of students from the educational grade level in which a prospective teacher desires to be placed. It may be used to assist in decision making regarding teaching fellowship awards to both native and international students.

Speculation about the potential usefulness of BCF measurement is unbounded. Future research must continue to address measurement procedure issues and simultaneously continue to uncover the impact of BCF in applied settings. Work is now progressing to analyze verbal and nonverbal correlates of BCF success and external variables not found in the

actual task setting. The conceptual model is now being integrated into the educational content of basic communication courses.

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## FOOTNOTES

[1]Previous work identified this concept as Technical Communication Competence. In order to avoid confusion with the academic area of Technical and Scientific Communication, the concept is now referred to as Basic Communication Fidelity.

[2]Detailed statements regarding methodological procedures and statistical analysis used in each of the following studies are available from the first author.

[3]Copies of BCF videotapes used in this study are available at cost from the first author.

Table 1

BCF Outcomes Following
Communication Behavior

| | Cognition of Source | Cognition of Receiver |
|---|---|---|
| 1. | $E = mc^2$ | $E = mc^2$ |
| 2. | $E = mc^2$ | $E = mc^3$ |
| 3. | $E = mc^3$ | $E = mc^3$ |
| 4. | $E = mc^3$ | $E = mc^2$ |

Figure 1

Communication Framework

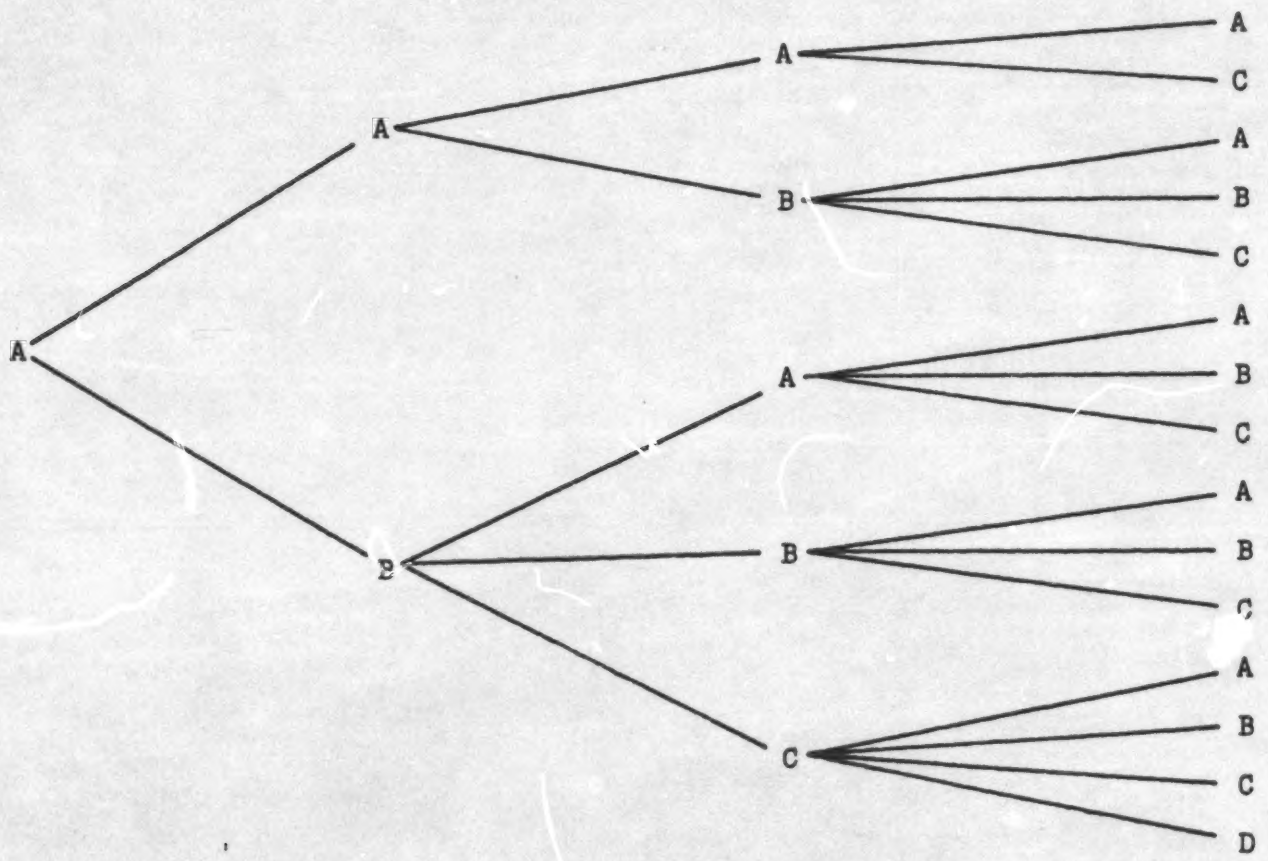

Figure 2

BCF Mental Image

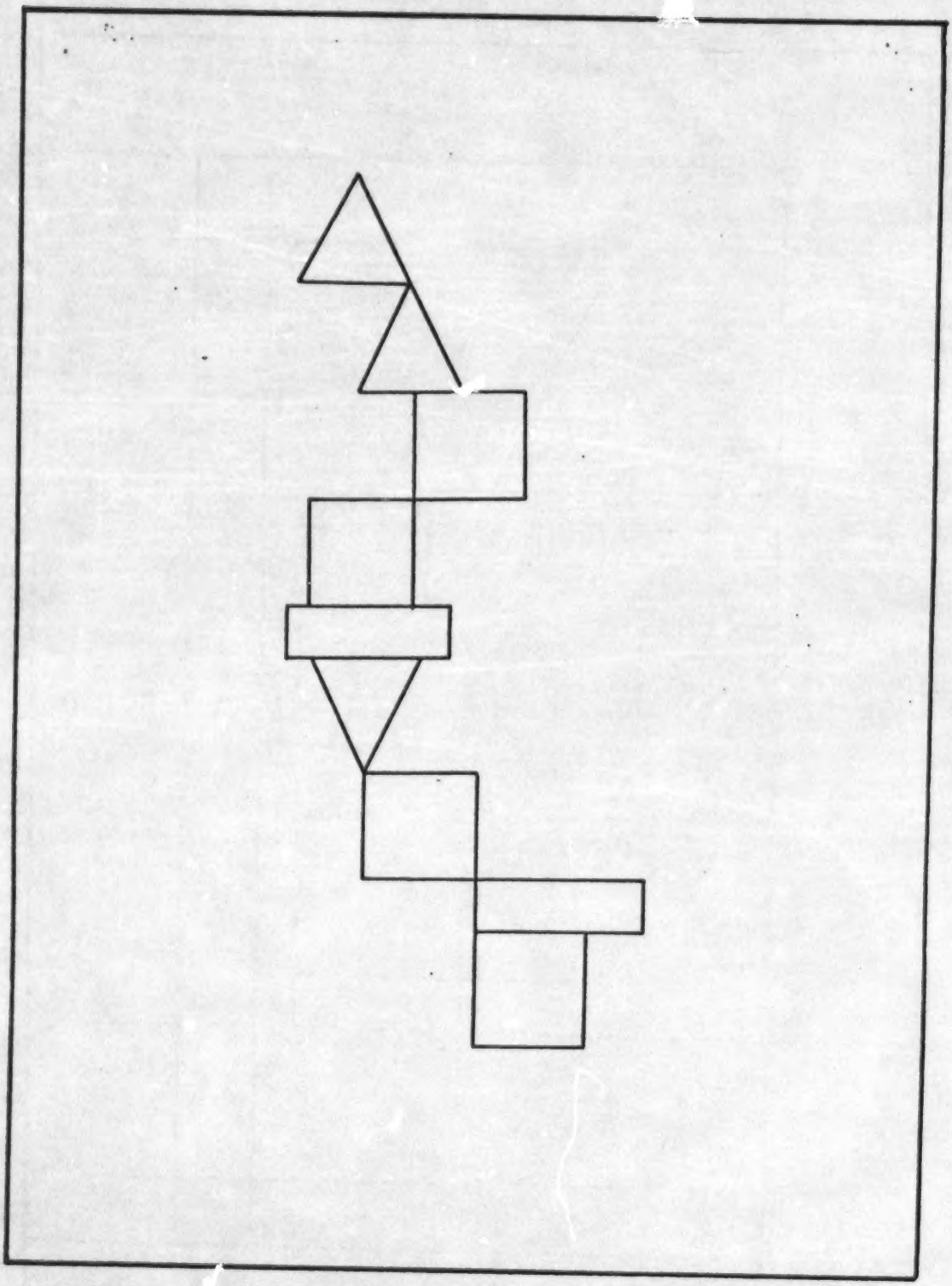

Figure 3
BCF Scoring Areas